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ABSTRACT

An issue of growing importance in rural economic development is the role of telecommunications and information technologies. Looking prospectively at the rural economies of the 1990s and beyond, a conference of 25 participants from various fields of expertise met to address the issues of how rural America will be affected, both positively and negatively, as more of the U.S. economy comes to depend on such technologies as teleconferencing, facsimile transmission, digital data transmission, electronic mail, and related systems. The conference discussions centered around three major topics: (1) rural policy and economic development including the reasons for concern, rural values, present economic development, current problems, ineffective policies, importance of self-determination, and emergence of new leadership; (2) the promise of telecommunications for rural America including an overview of existing rural telephone service, an examination of rural businesses and the possible uses of telecommunications, and telecommunications as an empowerment tool both in economic development and in rural education; and (3) strategies for action, such as upgrading rural telecommunications, the role of government, telecottages, and future research. (ALL)

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Communications and Society
FORUM REPORT

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THE IMPORTANCE OF COMMUNICATIONS AND INFORMATION SYSTEMS TO RURAL DEVELOPMENT IN THE UNITED STATES

Report of an Aspen Institute Conference
Aspen, Colorado
July 24-27, 1988

By David Bollier
Contributing Editor
CHANNELS Magazine

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An independent, international, nonprofit organization, the Aspen Institute brings together leading citizens to discuss issues of lasting significance. Its Program on Communications and Society serves as an impartial forum for assessing the importance of modern communications and information systems to the ideals and practices of democratic society.

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"I remember the Norman Rockwell painting of the young Henry Ford with a model of a horseless carriage in his hand, showing it to the village blacksmith. Ford is totally preoccupied. The blacksmith has this worried, puzzled, uncomprehending look on his face, but he knows damn well what its implications are -- that there won't be many blacksmiths when this technology is fully implemented.

"The applications of telecommunications and information technologies are so pervasive and so versatile that we don't <u>know</u> what the limits are, or what the full implications are. You can't show computers to anyone without provoking some kind of fear -- but also anticipation.

"What's significant to me is that these technologies alter <u>all</u> human relationships -- and not just those that are defined by the marketplace. And therefore the marketplace is not adequate for anticipating and understanding the consequences of these technologies. That, to me, is what compels public policy."

-- Marty Strange
Center for Rural Affairs
Walthill, Nebraska

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The Importance of Communications and Information Systems to Rural Development in the United States

In late July 1988, the Aspen Institute's Program on Communications and Society hosted a three-day conference on the role that telecommunications and information technologies might play in fostering rural economic development.

It is an issue of growing importance as more rural economies falter, often victimized by larger forces transforming the U.S. and international economies. Rural economies have been especially hurt by the decline of the U.S. dollar and intensified international competition, both of which have undermined the traditional rural industries of agriculture, mining and manufacturing.

The conference, funded by a grant from the Ford Foundation and organized in consultation with the Aspen Institute's Rural Economic Policy Program, looked prospectively at the rural economies of the 1990s and beyond. It asked how rural America will be affected -- positively and negatively -- as more of the U.S. economy comes to depend on such technologies as teleconferencing, facsimile transmission, digital data transmission, electronic mail, and related systems.

Will current trends result in a yawning telecommunications "infrastructure gap" between rural and urban America? Will that gap prevent rural America from becoming an integrated part of the national economy, resulting in chronic economic privation? Or will telecommunications and information technologies provide a rare opportunity for "importing" new industries into rural America, weaving its economy and people more tightly into the national fabric?

The conference sought to approach these larger questions by asking, first, more specific, refined questions. What particular needs and opportunities do the new electronic technologies provide rural America? What factors -- technological, economic, social and otherwise -- will promote or impede their actual use? If we can understand these issues, what affirmative steps can we then take to invigorate rural economies by way of telecommunications and information systems?

The Aspen Institute invited 25 participants from various fields of expertise to address these issues. The interdisciplinary sharing of knowledge drew upon rural development

economists, social scientists, state and county development officials, rural policy analysts, private business consultants, telephone company officials, and business users of telecommunications and information systems. These diverse experts are based at universities and other research institutions, or hold leadership positions in government, industry, foundations and rural advocacy groups.

Michael Rice, Director of the Aspen Institute's Program on Communications and Society and moderator of the conference, expressed his hope that the discussions would:

- Bring together the expertise of rural development scholars and telecommunications experts, and provoke fresh insights and ideas;
- Develop working hypotheses for the "leverage effect" -- i.e., how can new investments in telecommunications and information systems help a rural economy and its people?
- Identify specific topics for future research and explore what supportive roles federal, state and local governments can play.

I. RURAL POLICY AND ECONOMIC DEVELOPMENT

Why Care About Rural Development?

In an attempt to identify first principles, Michael Rice opened the first session by asking a painfully basic question: "Why should we care about the development prospects of rural America?"

The answers seemed to fall into several general categories of concern: maintaining diverse cultures and community autonomy, serving economic needs, promoting social equity, and enhancing environmental protection.

Dr. Philip Burgess, Executive Director of US West, one of the regional Bell operating companies, noted that "rural areas are the locations for some very rich cultures which enliven and enrich this nation." In the West, for example, Hispanics and Native Americans add a great deal to American culture.

Many rural residents, especially Native Americans, are deeply committed to their regions by way of their histories,

kinship and culture, said Professor Heather Hudson, Director of the Telecommunications Management and Policy Program at the McLaren College of Business at the University of San Francisco. For these people, who want to remain independent yet are frustrated by their economic problems, rural development is a very important concern.

Michael Clark, President of the Environmental Policy Institute in Washington, D.C., warned, "It is a dangerous concept to see rural areas marginalized and therefore made ripe for exploitation." As cautionary examples, Clark cited the history of mining in Appalachia and the current dumping of urban industrial wastes in rural areas.

There are strong economic reasons for bolstering rural regions, said Mary Mountcastle, Vice President for Economic Development of MDC, a nonprofit economic development organization in Chapel Hill, North Carolina. "The nation can't afford to waste its human resources in an age of increasing competitiveness and declining supply of human capital." Rural development is important because cities don't have the social infrastructure to deal with untrained new workers.

Like many participants, Ted Bradshaw, Research Sociologist at the University of California, Berkeley, cited the economic hardships of rural America as a compelling reason for new development initiatives. He mentioned the overall decline of rural export commodities, the slack lumber business in the Pacific Northwest, and the effects on the South of stiff international competition in manufacturing.

Why do European nations care about rural development? John Bryden, Program Director of the Arkleton Trust, a rural policy research group based in Inverness, Scotland, noted three general reasons: 1) Respect for basic human rights, such as equal economic opportunity; 2) A desire to make better use of human resources which, because of distance and lack of mobility, are underutilized; and 3) A desire to maintain native rural cultures and lifestyles.

"I think there is value in fostering cultural heterogeneity [in rural regions] as we move into a global economy," said Dr. Don Dillman, Director of the Social and Economic Sciences Research Center at Washington State University.

Dillman added, "I worry about a split society, in which educated people marry educated people and live in urban areas, because that's the only place they can get jobs, and uneducated people marry each other and live in rural areas."

Public policy is by definition intended to rectify economic and social injustice, said Marty Strange, Senior Associate for the Center for Rural Affairs, an advocacy group based in Walthill, Nebraska. Public policy exists because "the old world of Adam Smith isn't enough. There's more to life than improving efficiency."

Kenneth Deavers, Director of the USDA Economics Research Service's Agriculture and Rural Economy Division, agreed that at the federal level, economic equity is the most influential argument for rural development policy. "It is a reason that [rural policy] has broad-based support. It provides a way to engage those who believe market forces only should prevail."

The answer to "why care about rural policy" is almost too obvious, said Andrew Roscoe, Senior Consultant for EMCI, a management consulting firm based in Arlington, Virginia. "We are a unified country and that's why we try to help each other. There is an inefficiency inherent in development strategies, because the natural economic forces tend to make things more efficient if we don't interfere with them.

"That's not to say we don't interfere," he added. "The question is, How much cost and loss of efficiency are we willing to incur to target development [to rural areas]? How much do we want to let natural economic forces play themselves out?"

Rural Values and Economic Development

Rural economic development is not just about the merits of laissez faire versus public policy intervention, participants soon made clear. It is also about the terms under which any economic development proceeds. It is about the values that are reflected in public policy.

The group quickly expressed concern about how economic development affects the indigenous values of rural communities. On balance, is development beneficial or destructive?

Scott Howard, Director of Catalog Operations for L.L. Bean, the retailer, questioned whether "we should be imposing metropolitan socio-economic values on rural parts of the country." He pointed out that while some parts of Maine might be considered impoverished by objective standards, rural residents value, and want to protect, their way of life and independence.

Richard Silkman, Director of the State Planning Office in Maine, elaborated on this point: "Development in rural areas is a much more difficult and expensive proposition because the infrastructure simply isn't there." Rapid development triggers overnight problems with solid waste disposal, groundwater contamination, traffic congestion, crowded schools and other problems that suburban communities have taken decades to address.

The claim that these emerging needs can be painlessly financed by the fruits of economic growth just isn't true, said Silkman, because rural people end up paying higher property taxes and suffer from cultural dislocations and environmental pollution. That is why many rural communities are very skeptical of metropolitan models of development.

Indeed, economic growth does not necessarily eradicate poverty, said Stuart Rosenfeld, Deputy Director of the Southern Growth Policies Board, a "think tank" that creates strategies for economic growth for 12 southern states and Puerto Rico. Of the 38 fastest-growing counties in the South, nine of them are what USDA classifies as persistent poverty counties; 12 of those 38 had per capita incomes of less than $7,000 a year.

Yet a staunch anti-development stance is not necessarily the solution either, said Cynthia Duncan, Associate Director of the Aspen Institute's Rural Economic Policy Program. Although development does bring problems, it also serves -- or tries to serve -- acute human needs. In Maine, for example, "there are kids trapped in rural areas who need jobs."

Duncan's comment points up a conundrum: Rural areas need help, especially from urban businesses and the federal government, yet they also prize their independence and want to protect it.

Community autonomy is why there are some 1,100 separate school districts in Texas, said Dr. Frederick Williams, Professor at the University of Texas at Austin's College of Communications. "It is inefficient but the districts <u>want</u> to retain their separate identities and not consolidate. It gives them a sense of power and self-control."

The Current Plight of Rural America

While small rural towns may like to see themselves as distinctive (and indeed, they may be), the USDA's Ken Deaver warned that their economies must be viewed in the context of the national economy. Many rural economies are suffering because they are out of sync with the national economy.

Approximately 40% of rural counties remain heavily dependent on agriculture or mining, two declining industries. The economies of another 30% of rural counties are based on manufacturing, which tends to be low-wage, low-skill, mass production activity that is especially vulnerable to international competition and cyclical downturns.

As the national economy grows increasingly dependent on services, the rate of new-firm creation in rural areas is very low, and the urban-rural differential is growing, Deavers said. Rural areas seem plagued by fewer enterpreneurs, fewer opportunities, more difficulty in finding out about opportunities, higher information costs, and the siphoning away of rural money to regional and urban businesses.

Because it is very unlikely that ailing rural industries will generate many new jobs in the future, rural communities hoping to remain viable must develop some new "opportunity structures," Deavers observed. The problem is <u>how</u> to get there from here. "How can [rural towns] participate in service economy growth, particularly the <u>export</u> of (business) services beyond the local community?"

Historically, rural communities have been "able to survive because of 'location-specific rents,'" said Richard Silkman of the Maine State Planning Office. "What's happened over the past 20 years is that technology, the finding of other mineral deposits, the growth of foreign agriculture, and other factors have made location-specific rents in the U.S. much less valuable."

This is ominous for rural America, said Silkman, because "telecommunication is going to diminish <u>further</u> the value of location-specific rents and make location a non-factor [in economic decisionmaking]. If this is so, what is going to be the economic base of rural America?"

One residual advantage that rural communities retain, noted Ted Bradshaw of UC Berkeley, is their lifestyle

amenities. "With the rise of more 'mobile occupations,' and even mobile industries, more people will be attracted by rural isolation. Retirees have already done this, bringing their Social Security checks with them."

"But this creates tension," replied Silkman, because a set of monied newcomers competes with the native population over different visions of quality of life. So you have to come back to the basic question, 'How do you manage growth to preserve quality of life?'

One new basis of location-specific rents for rural communities could be human resources, said Jim Roche, Marketing Director of the Northspan Group of Duluth, Minnesota. "In northeastern Minnesota, an available, educated workforce is a major incentive to attract businesses," Roche said.

Before rural America can revive itself, it must first acknowledge that a problem exists, said Rod Bates, Managing General Partner of Bates Video Production in Lincoln, Nebraska, and former Director of Economic Development for Nebraska.

Many small towns are going through a sequence of psychological responses to economic decline, he said -- from denial to anger to bargaining to acceptance, in the formulation of Elizabeth Kubler-Ross (On Death and Dying). After so many years of economic tumult, said Bates, "the environment is ripe in many towns for seeking change and redefinition."

But the situation is not uniformly bleak, even in declining industries, said Philip Burgess of US West. While mining has lost 321,000 jobs since 1980, there has been an increase of nearly 5,000 jobs among mining companies with fewer than 100 employees.

Burgess' conclusions: The small entrepreneurial firms, not the "old, big dinosaurs," are creating new jobs. Yet the large companies have the political clout to win preferential government policies -- and that's a problem.

It is one reason that rural policy is such a shambles, said several participants: most rural political leaders do not fight to improve the lot of non-agricultural constituencies.

Rural Policy in a Shambles

"My sense, living in the Northeast, is that we don't really have a rural policy," said Richard Silkman. "We have an agricultural policy. Our rural policy, such as it is, seems to be, 'Let people migrate to where the jobs might be.'"

Other participants agreed that agricultural needs are too often perceived, incorrectly, to be the sum total of rural needs. Jack Briggs, Executive Director of the Macon (Missouri) County Economic Development Office, noted that according to the 1980 census, only 900 of his county's 16,000 residents were based on farms, and half of them held off-farm jobs.

"So in our area, if you talk about rural policy, you're talking about 450 people out of 16,000. All our legislators want to be on the agriculture committee. We say, 'Why?'"

"The reason we do have an agricultural policy and not a rural policy is because it's urban people who are making policy, and urban people have to eat," said Edwin Parker, a consultant based in Los Altos Hills, California, former telecommunications professor and president of an earth-station manufacturing concern.

But Michael Clark, the environmentalist, added that a deficient rural policy is not solely the fault of urban Members of Congress, who "don't know or care about or understand agricultural policy." Rural areas themselves elect legislators whose chief concern is agriculture -- and that interest short-changes other rural constituencies who could benefit from broader, more innovative rural initiatives.

If the failures of current rural policy can be blamed on current configurations of political power -- among both urban and rural policymakers -- participants agreed that a deeply rooted intellectual tradition must also be challenged: the imposition of urban policy models on rural areas.

Federal demographers refer to rural areas as "non-metro" counties, a negative comparison which always seems to make rural areas seem worse, complained Michael Clark. He urged instead, "Let's look at healthy rural communities as models; income levels and other national standards may not be the best criteria to judge rural towns."

The Importance of Rural Self-Determination

This is the missing dimension in so much rural policy, said one participant after another: the actual desires of each particular rural community.

"If you start with the idea the local communities like being where they are, the proper policy will follow," said Rod Bates, the video producer from Lincoln, Nebraska. "I don't know if you can have an enlightened federal rural policy. People in rural communities have to define why they like it there. Then they can decide whether to bring in a new plant or fiber optics."

Public policy works much better, said Mary Mountcastle of MDC, when people have a certain "ownership" stake in it. In choosing what kinds of telecommunications investments should be made, community leadership must cultivate broad-based support.

Federal and state policies can be crafted to offer resources and technical assistance to local communities without imposing on them, said Stuart Rosenfeld of the Southern Growth Policies Board. He offered as an example the Appalachian Regional Commission's role in building 700 vocational training centers.

"What strikes me," said Philip Burgess of US West, "is the tremendous variety and diversity in rural America. The lesson of that is that no single federal policy is going to work." Burgess urged that any innovations in rural policy focus on the "institutional policy architecture" rather than policy per se, because the power politics of rural policy determine whether it will be successful or not.

In the 1960s, Burgess continued, we were moving toward area-based development programs such as the Model Cities program. "Despite its flaws, this approach must be resurrected because it provides a political basis for politicians to favor one region over another. It provides a way to decentralize the forums in which political negotiations take place.

"Without such hybrid forums," warned Burgess, "we'll just have another wasteful Economic Development Administration (EDA) or Appalachian Regional Council (ARC)." He urged that we study why these agencies failed, and learn some lessons about how federal leadership interacts -- inefficiently and corruptly -- with local civic leadership.

Susan Sechler of the Aspen Institute agreed that in many 1960s programs the local political process was "deeply flawed in determining priorities and seeing who got benefits" -- a flaw that, to some extent, the Office of Economic Opportunity surmounted.

The real challenge, said Sechler, is to find a way to enhance political participation in rural economic development without creating another layer of policymaking that will be unresponsive to what local citizens want and need.

Given the diversity of rural America, Michael Rice asked whether <u>any</u> uniform national rural policy is really possible.

Ken Deavers responded that a rural policy which simply aggregates the diverse choices of hundreds of rural communities would be far too costly and impractical. "A bottoms-up approach with no sense of the national economy and its opportunities is hopeless. If you start with what every rural community wants to be, regardless of the constraints, and add it all together, the cost of achieving it would amount to five times the GNP! You will waste enormous resources trying to get people to be something they can't be."

Marty Strange of the Center for Rural Affairs suggested that one uniform goal of federal rural policy could be the "empowerment of people to make their own development decisions."

Federal policy must take cognizance of the "power structure" by which policy is made; otherwise rural policy will simply end up gentrifying rural communities and fail to address persistent rural needs. Strange concluded that "any discussion of technology policy and development must talk about who wins, who loses, and who's in charge."

Michael Clark agreed. A key question, he said, is "<u>Who</u> makes decisions about rural development? As our society becomes more complex and technological, most of these decisions are made by a small elite -- leaders in industry and government, and heavy users of telecommunications."

Burgess argued that these elite groups -- civic leaders, business leaders, economic development consultants, and foundations -- are often more a part of the problem than a part of the solution. "They don't really know what they are doing."

"There is no profession of economic development," he said.

"We don't have a body of knowledge that can be passed on and refined, and to which people can be held accountable. These leaders are influencing people to take action, to spend public money -- often hurting rural communities."

Can New Leadership Emerge?

There seems to be a quandary here, said Michael Rice. "If rural policy does not have legitimacy without maximum citizen participation, yet today's political officials do not have the 'right' views about wise economic development, how then are the 'right' choices going to emerge? Where will leadership come from?"

Heather Hudson suggested that telecommunications can help give people access to government proceedings -- and this can help develop leadership. In Alaska, for example, telecommunications allows citizens from distant communities to participate in hearings at the state capital.

"Beware of Alaska examples," cautioned Fred Williams. In Los Angeles, an experiment was held to let citizens participate in civic hearings via broadband communications. "The problem wasn't channels of communications but lack of interest." From his experiences in Missouri, Jack Briggs agreed -- the idea of "informed, active local participation" is a myth.

Hudson replied that telecommunications can facilitate participation; it does not guarantee participation. What's important is that you go "looking for thirsty horses" -- people with leadership potential who will be receptive to help.

Developing leadership to foster better rural telecommunications is not a partisan issue, said Scott Howard of L.L. Bean. It is a prerequisite for rural economic development. One of the biggest challenges, said Don Dillman, "is to convince ingrown locals that new and different strategies should be tried."

One fertile source of leadership is rural entrepreneurs who left rural towns and then returned many years later, bringing back new cultural and educated perspectives. Dillman said that some companies such as Bausch & Lomb have tried to identify such people by acquiring subscription lists to local newspapers and then wooing out-of-town subscribers to come back.

The problem of attracting educated people back to rural areas points up another persistent challenge, said Dillman.

"Why do people like living in rural areas? Residential preference in rural areas is a greatly under-researched issue."

Participants suggested some anecdotal answers to why rural residents live where they do. Rural residents may have extended families and strong community ties; they may be close to nearby job opportunities; and other opportunities elsewhere may be perceived to be too low-paying or unstable to justify moving.

Residential preference is a key factor often overlooked in rural development schemes, said Ken Deavers, citing a recent proposal by Senator Max Baucus of Montana. Baucus proposed a survey of firms to find out what facilities they want in rural communities; then the federal government would help underwrite the building of such facilities.

"If you want to develop rural Montana," said Deavers, "one of the first things you need to do is find out what kind of people want to live in rural Montana. Then you start thinking about the infrastructure investments and public policies that will serve those kinds of people."

It just doesn't work to ask business about amenities it wants in rural areas, when it can just as easily pursue the same amenities elsewhere, said Deavers. A case in point: many industrial parks around the country financed by the Economic Development Administration which have no tenants.

II. THE PROMISE OF TELECOMMUNICATIONS FOR RURAL AMERICA

A Snapshot of Existing Rural Telephone Service

There are three basic functions that better telecommunications can provide to rural communities, said Andrew Jacobson, Associate Publisher of Telecom Publishing Group, which publishes several telephone-related trade newsletters.

The first, arguably most important, function is to extend basic telephone service to remote locations and to poor people. A second function is to provide new operating efficiencies for businesses. And a third function is to provide residents of remote rural areas access to new educational opportunities.

Extending the telecommunications revolution to rural areas should be governed by six tiers of priority, said Don Dillman. Listed in order of importance, the priorities should be to:

1) Extend basic telephone service to everyone;
2) Move from party-line service to dedicated service;
3) Improve the quality of telephone lines so that data transmission is possible;
4) Lower long-distance rates so that basic voice communication to the nearest areas is more affordable;
5) Provide local-access rates to computer data banks, so that "connect time" fees are more affordable; and
6) Expand the capacity of telephone lines so that faster and larger data transmissions are possible.

Current deficiencies in rural telephone service can limit personal communications and a community's economic development. For example, poor-quality lines may make data transmission impossible; limited trunk-line capacity may prevent volume data transmissions; lack of touch-tone service can prevent interactive communications; and analog switching equipment may keep long-distance rates higher than what could be achieved through digital switching equipment.

At present, 5% of U.S. households do not have telephones, primarily because they cannot afford one, according to Andrew Roscoe of EMCI. The number of households without phone service because of their remoteness is 173,000, he said, although the Rural Electrification Administration's estimate is 500,000.

How many party lines still remain? There are 1.7 million party lines out of the Bell companies' 97 million households, and 1.8 million party lines out of the 25 million households served by independent phone companies.

Rural residents pay three to four times more for telephone service than city dwellers, said Heather Hudson. This is partly because rural phone service is governed by a different rate structure, but also because rural residents spend a larger percentage of their (lower) income on phone service.

John Bryden of the Arkleton Trust offered a compelling critique explaining why telecommunications and information technologies are of growing importance to rural communities.

Services are the fastest-growing sector of industrial economies and are becoming integrated into all forms of final production, noted Bryden. This has profound consequences for a company's or region's competitiveness, because the production of traded goods and services increasingly depends on the efficiency and quality of such services as accounting, banking, legal services, printing, and design.

This trend can both help and hurt rural communities. On the one hand, it makes them more vulnerable to competition from "outside" firms, because new communications technologies are overcoming distance-related costs. But by the same token, the new technologies give rural services new opportunities to grow far beyond local markets.

The question is, will rural towns exploit, or be exploited by, these technologies? At present, the latter is occurring, and rural America is in danger of becoming a net importer of services. That is why it is imperative that rural communities learn how to identify and efficiently serve "export" markets.

But first they must develop a better telecommunications infrastructure (digital switching, better lines, dedicated phones, etc.). This also means having to educate and train rural leaders and the public about the need for better telecommunications.

Rural Business and Telecommunications

What are some of the specific ways that advanced telecommunications can help rural economies? Most cases mentioned by participants were variations on a theme -- that rural America cannot keep pace with the rest of the U.S. economy unless it acquires new electronic technologies, particularly digital switching.

Consider the hospital supply business. Richard Silkman said that a major management task faced by all hospitals is the maintenance of their inventories of medical supplies. Using sophisticated telecommunications, a midwest hospital supply company negotiated an exclusive contract with Chicago hospitals to maintain an online inventory control system for hospitals. Result: nearly instant replenishment of supplies.

If you happen to be a Kentucky beaker supplier, however, you are forever excluded from the Chicago hospital market unless you can offer the same online capability. Even if you sell via the wholesale vendor, you would still need the online capability. The lesson: rural-based businesses that want to maintain their traditional supply relationships will have to keep up with new telecommunications developments.

Why is this a public policy problem? asked Andrew Jacobson. He said private consultants can help rural businesses set up perfectly serviceable satellite linkages.

"But small businesses don't have telecommunications managers," replied Richard Adler of the Institute for the Future. In a survey he conducted in Palo Alto, small businesses such as branch banks, wholesale meatpackers and medium-sized law firms simply do not know what telecommunications options could improve their businesses -- or how to acquire them. The problem is presumably more acute in rural areas, said Adler.

If ignorance is not the problem in rural areas, the simple lack of enhanced telecommunications often is. Fred Williams of the University of Texas at Austin told of a national chain of hardware stores which is beginning to require its franchisees to obtain an online ordering system as a condition for retaining their dealerships. Eventually the franchisees must be able to communicate with the national headquarters, with a modem at 2400 baud, on the public telephone network.

Before this can happen, however, local independent phone companies must upgrade the quality of their lines so that modem transmissions can work; this in turn will require approval by the public utility commission. (The request is being studied.) Many Texas school districts, Williams added, are also starting to require their schools to develop an online capability.

The story was told, also, of a Montana businesswoman who may be forced to move her thriving rural business to a larger town, perhaps out of state, because of poor telecommunications. The phone lines do not allow fax transmissions, and overnight mail to her location is not reliable enough.

These examples suggest how better telecommunications are becoming more vital in everyday business transactions, even for small businesses.

While rural businesses struggle to keep up, major corporations are using enhanced telecommunications to relocate and decentralize, so they can take advantage of relative economic advantages (cheaper labor, supply routes, etc.). While this may provide new investment to needy rural economies, it also makes them more acutely dependent on outsiders.

An example of this trend, said Stuart Rosenfeld of the Southern Growth Policies Board, is "outsourcing," a process by which major companies farm out certain basic production tasks to rural towns with cheap labor and rent. To work, outsourcing requires fairly advanced telecommunications.

Fred Williams noted that General Motors is heavily committed to outsourcing. GM now runs several fabrications plants in Juarez, Mexico, along the Texas border, via an EDS system which controls inventory, production details, etc. The system uses broadband communications from Mexico, and then connects to privately-leased AT&T phone lines, bypassing the local telephone exchange in Texas and Detroit.

As part of its goal of slashing its per-car production costs by $1,000, General Motors also uses telecommunications to order parts and exchange CAD/CAM drawings (engineering and design plans) with suppliers, accelerating the design and production process.

Other examples: Ed Parker told of a commodity news service based in a rural area that could not get daily market quote information because it was tied into a four-party phone line. The problem was solved with a receive-only satellite dish which received satellite data signals.

Ed Parker said that U.S. Forest Service rangers at remote locations are equipped with small transmit-receive stations, so that all stations can report in to headquarters. The Bureau of Land Management has similar but unattended earth stations that transmit data to help fight forest fires.

"Electronic data interchange" (EDI) is a growing trend in many industries, said Richard Adler. Such routine documents as purchase orders, invoices, and bills of lading are now being handled electronically. Roughly 85% of the dollar-volume of drugs ordered from drug distributors now occur through EDI. Burroughs Wellcome will accept orders only through mail or EDI; no phone orders are accepted.

This trend works to the disadvantage of smaller companies which may actually be more efficient, said Adler. One solution has been the Hospital Distributors of America, a consortium of smaller companies which collectively provide electronic, national access to their products via EDI. They constitute a "virtual company," said Adler.

Stuart Rosenfeld added that telecommunications is becoming a new competitive factor in southern states, as manufacturing moves away from low-wage, mass-production activities. More advanced manufacturing requires much closer ties with suppliers and markets, and is more dependent on the movement of information.

Telecommunications as an Empowerment Tool

A key issue in the emerging role of telecommunications is how it alters -- or reinforces -- existing power relationships between buyers and sellers. Typically, major corporations use telecommunications to enhance their market advantages, often, if inadvertently, at the expense of rural America, whose use of telecommunications is usually a defensive attempt to stay competitive.

But can telecommunications be used to transform existing market relationships to favor rural America, or at least equalize bargaining power in the marketplace? Several participants expressed great interest in this potential.

One reason this issue is important to rural economies, said Marty Strange, is because "rural economies are characterized by many sellers of undifferentiated products and few buyers -- which is the exact opposite of urban markets. This has a special impact on the small commercial farmer, who remains the most omnipresent business activity in rural areas (even if the occupation does not employ the largest number of rural people)," said Strange.

The new trend in many livestock-raising areas is direct buying; the buyer visits larger farms (minimum, 1,000 head of cattle), quotes a price, and makes the buy on the spot. Smaller farmers still have to take their cattle to market, which puts them at a serious bargaining disadvantage. If they think the price quoted upon arrival at market is too low, they do not have any feasible alternatives; maintaining the cattle at market or returning home are both too costly. So they end up being forced to take whatever price is offered.

"What is the potential for telecommunications to remedy this situation so that small farmers can get a price on cattle before moving them to market?" Strange asked. "Packers have scuttled most experiments for telemarketing of cattle because they do not want a more competitive environment. They have monopsonistic power."

Heather Hudson told how one of the major cattle buyers set up a two-way telecommunications system a few years ago so that its buyers-in-the-field, with access to the latest market data, can optimize the price and day of delivery of cattle. The company calculated that if the system allowed them to bid 1/2 cent lower per pound of meat, the system would pay for itself within six months.

The challenge is to harness this technology to benefit sellers of cattle (farmers) as well. Small entrepreneurs in

The challenge is to harness this technology to benefit sellers of cattle (farmers) as well. Small entrepreneurs in other businesses that face competitive disadvantages could benefit from this capability, too. An extra fillip, said Hudson, "is that income stays local and helps develop the local economy."

The State of Texas' education agency is taking advantage of this insight, said Fred Williams. It is encouraging school districts to do their own payroll work, accounting, etc., so that instead of paying $25,000 to distant service centers, that money is spent locally and bolsters the local economy.

Rod Bates said that many available telecommunications systems -- such as microwave technology owned by public television systems in Nebraska -- simply are not being fully exploited in experimental ways. There are a few examples, such as "Agri-vis," which provides the latest market prices for various commodities, and "High-vis" for the hearing impaired. But people often do not have the "comfort level" of innovating with new and unfamiliar technologies.

Telecommunications can bring new vitality to remote, economically isolated communities, said Philip Burgess. He told of a Navajo entrepreneur from a remote region of southeastern Utah who, through a business contact in Japan, built a thriving business exporting his tribe's artwork to Japan, Europe and elsewhere. The business, which employs 150 people, would not be possible without a digital-switched telephone system. Navajos who had left for urban areas are now returning to work for the tribe's business.

Economic Development and Telecommunications

Intuitively, most participants believed that telecommunications is important to rural economic development. But what is actually known, empirically and systematically, about this presumed linkage? Michael Rice asked.

Edwin Parker noted that Andrew Hardy, as part of his doctoral dissertation, documented the historic correlations between telephone availability and economic development. He compiled statistical evidence linking telephones to development, indicating that investment in telephones in one time period correlates with increased wealth in a later period.

Parker added that there is macroeconomic evidence showing that the lower the population density, the greater the economic

advantage of having a phone. But what is perhaps most important is the indirect impact of telecommunications in enabling information to be exchanged and used. Railroads themselves did not cause economic development," said Parker, "It was the goods and people transported over the railroad. So it is with telecommunications."

Heather Hudson said that we really do not know how and why telecommunications assists economic development. Still, a number of case studies of Third World rural economies provide useful lessons. [These studies are sponsored primarily by the International Telecommunications Union (The Missing Link), the World Bank (Telecommunications and Economic Development), and the U.S. Agency for International Development.]

Hudson urged that we correlate studies of Third World nations with U.S. rural economies; learn how to apply plentiful knowledge about the "information sector" to rural economies; and explore secondary uses of information in manufacturing processes.

"We can build a mosaic from existing research," said Hudson, "but we need to build a clearer overview of the national picture." One useful starting point may be Canadian historian David Lines' study of the analogy between railroads and telecommunications, she said.

Don Dillman warned that the historic pattern of technology diffusion is for rural areas to lag behind cities. If this happens with telecommunications, first rural areas will not be able to attract businesses; then urban-based businesses will use telecommunications to "suck out" business and capital from rural areas.

Furthermore, said Richard Silkman, universal service -- either plain-old-telephone service or enhanced services -- may be jeopardized because rural areas will not have the business-related volume usage which, in urban areas, has been and continues to be used to underwrite universal service.

The paradox, said Silkman, is that a fiber-optic cable will not be installed for rural areas unless there is an economic justification for it. Yet no economic justification may materialize unless the cable is installed.

Telecommunications may not ensure economic development, but it can provide an infrastructure that enables development to proceed, all factors being equal.

As an example, Silkman cited the city of Portland, Maine. Telecommunications has allowed the city to develop its own financial, legal, accounting and data-processing services, and thereby to serve as an intermediary financial link to rural Maine and northern New England.

The social exchange between mid-sized cities of 60,000-to-200,000 population also "cross-fertilizes" rural areas with new ideas and cultural attitudes, said Cynthia Duncan.

As a first priority, rural areas need to develop local services that substitute for imported services, said Philip Burgess. But for long-term economic development, rural areas must develop a base of traded services. These services will be more stable because they will not be so susceptible to local business cycles.

But it was pointed out that the more significant traded services, such as Omaha's toll-free 800 answering services and Citibank's Sioux Falls credit card operations, are occurring in mid-sized cities, not rural areas.

Michael Rice returned to the original question: Does telecommunications actually spur economic development?

"You can't measure missed opportunities," said Stuart Rosenfeld.

"What you do know," said Philip Burgess, "is that rural America will be left behind, and at a much faster rate, if it does not have better telecommunications. It's harder to make the 'positive case' as convincingly. But you have to take risks," Burgess continued. "That's what leaders are for. Sometimes you make mistakes. But you sometimes have to make a leap of faith."

In short, Michael Rice concluded, enhanced telecommunications may not be a sufficient condition to spur rural economic development, but it is a necessary condition.

Rural Education and Telecommunications

One of the most promising uses of telecommunications in rural America is to improve access to education. "Distance learning" through teleconferencing can provide specialized expertise and training to rural areas that otherwise would not have such educational opportunities.

Distance learning could help close what Scott Howard called "the aspirations gap" in rural America -- a culture of low ambition reinforced by the lack of access to telecommunications, information, and education.

What promise does distance learning hold? Besides remedying shortages of specialized expertise in rural areas, telecommunications can help prevent consolidation of school districts, said Marty Strange. "It is important to preserve local participation and local schools."

In the United Kingdom, telecommunications are being used to create "electronic support groups" of affinity groups, such as disabled people, in remote areas, said John Bryden.

In northeastern Minnesota, local education officials and nonprofit leaders built a fiber-optic cable between five colleges so that students could take a broader array of courses, via teleconferencing, and obtain four-year degrees. Without this capability, said Jim Roche of the Northspan Group, students would have to travel 400 miles to the Twin Cities.

Philip Burgess said telecommunications has been used in many instances to provide continuing education and professional development. These examples include:

- The LaJolla Western Behavioral Science program has a week-long computer teleconferencing program for high-level corporate executives, held in conjunction with person-to-person meetings.

- The University of Colorado Health Sciences Department has a computer teleconferencing program to train health administrators.

- The Federation of Rocky Mountain States ran an early satellite education demonstration project in the 1970s which had mixed results, but thorough evaluations of the project could prove useful for later experiments.

Stuart Rosenfeld, like most participants, agreed that distance learning may improve the <u>quantity</u> of education in rural areas. But does it really improve the <u>quality</u> of education as well? Too little is known about the effects of distance learning.

While quality of education may sometimes suffer through distance learning, John Bryden insisted that any enhanced access to education is a big improvement for rural residents.

Fred Williams said he is impressed at the new ways being found to increase the personal interactions of distance learning. In the "Tie-In" distance-learning program in Texas, the centralized instructor knows the names of his 30 or so students and there is interactive, point-to-point communication rather than simply mass communication to passive students.

But Rod Bates said that many educators fail to use the technology in ways that truly enhance education. Either there is no interaction between students and teachers, the video is "boring talking heads," or "glitzy production values get in the way of education." As teachers and students become more comfortable with the VCR and other technologies, however, instructional materials are becoming more tailored to user needs.

Don Dillman agreed that many faculty are not trained to use interactive video technologies appropriately; a stand-up lecture is the norm. Bates said that is why it is important that users customize the technology for their particular needs.

New information technologies with larger memory storage are making it easier for users to customize, said Edwin Parker. Using VCRs and CD-ROMs, one can achieve interactivity without teleconferencing.

"But don't all these distance-learning schemes presume a high level of student motivation?" asked Michael Rice. "Does that level of interest exist?"

Hudson agreed. "Motivation <u>is</u> critical. Teleconferencing is less successful for mass instruction. Also, there has to be an institutional setting (such as local tutors or discussion groups) to help provide motivation."

But it <u>works</u>, Hudson stressed. Nurses in rural Texas who want continuing education credits are motivated to learn, even if it is via an interactive audio network. Bates told how insurers are now using teleconferencing to educate their agents about a new insurance investment product.

Burgess agreed that teleconferencing in education is a "highly focused, need-oriented sort of technology." Its chief value, he said, "is getting people into the system who wouldn't get in otherwise." People seeking higher-level education -- such as professionals and teachers -- may have greater motivation to use these technologies than ordinary students.

But Kenneth Deavers objected that "the people in rural areas who most need to be reached -- for basic literacy and

skills training, for example -- aren't in institutional settings such as schools and workplaces." That's why we must be innovative in devising the institutional settings for reaching rural people, Deavers said.

One solution may be to get people together with their peer groups in their own social milieu, said Mary Mountcastle of MDC, Inc. This can help shy and skittish novices overcome the "comfort factor" problem in using new electronic technologies. That is how farmers in east North Carolina learned to use a computer; they formed a coop and learned together. Perhaps black churches could be a worthwhile institutional vehicle for learning through teleconferencing.

Richard Adler agreed that "you need a delivery mechanism that involves people." He cited a science teleconferencing project, KidsNet, in which children from geographically diverse classrooms interact with other classrooms and send data from science experiments to a central location. "It is a low-cost way of changing kids' feelings about science education," said Adler. "They feel like they're part of something bigger."

Silkman was skeptical about the potential misuse of distance-learning technologies. "Whenever I hear the word 'teleconferencing' or 'video instruction,' the only justification I ever hear for it is cost. I don't hear about student interest or quality of instruction."

Silkman worried that, given the large capital investments that these technologies require and the very high cost of providing elementary and secondary education, state legislatures will be tempted to promote them as cheap substitutes for "real" teachers and educational materials. Distance learning could end up being used in inappropriate settings, such as grade schools, where it is less effective (and, thus, more expedient) than traditional instructional processes.

III. STRATEGIES FOR ACTION

How to Upgrade Rural Telecommunications?

Participants agreed that rural America's limited telecommunications often put it at a disadvantage in today's economy. But what strategies can transform the situation?

This question implies a series of profound changes -- in public attitudes toward telecommunications, regulatory

policies, configurations of political power, and how to finance such infrastructure investment.

For starters, said Richard Adler, Director of the Teleservices Program for the Institute for the Future in Menlo Park, California, it is a big mistake is "to conceive of telephone service as two phones talking to each other. This misconceives the vast potential of digital telephone networks."

Digital telecommunications allows voice, data, image and graphics to be combined together. They can be compressed, edited, stored and transmitted more efficiently (and thus more cheaply) than existing analog telecommunications systems, which have limited capacity and slower transmission rates.

Digital switching equipment helps greatly reduce the costs of long-distance telecommunications and thus has immense implications for rural economies.

[Ed Parker said that 44% of rural communities had digital switching as of 1986. The Northeast will be completely digital by 1992 and Bell South by 1991. Digital upgrades by all independent phone companies could take a generation.]

L.L. Bean runs its immense catalog sales operation from Freeport, Maine (population, 5,000), with digital switching equipment leased from the local telephone exchange carrier. (The switch bypasses the exchange, and so is not available to the average residential phone user.)

Digital switching gives L.L. Bean huge efficiencies, as Scott Howard described: "If I were to increase the average call length by 10 seconds [by using analog equipment instead], the additional cost of the toll-free 800 service alone, not including labor costs, etc., would be over $500,000."

As digital service becomes the norm in urban regions, rural communities are quickly falling behind. But upgrading rural telecommunications quickly runs athwart the question of who will pay for it -- and under what terms?

The issue often pits consumer advocates favoring low-cost basic service using existing technologies against businesses favoring advanced telecommunications systems with the costs folded into the rate base paid by everyone.

"We're in the midst of a policy climate," said Michael Rice, "which seeks to allocate actual costs to actual users, without cross-subsidies." The rationale for this trend is to

improve efficiencies while financing the upgrading of telecommunications technologies, said Rice.

"If businesses are driven to bypass the local exchanges," said Edwin Parker, the consultant, "we're going to further disadvantage entrepreneurs in rural areas. Many rural systems need to be upgraded anyway, if only because of the cost of maintaining the existing systems."

"We have got to find a way [for rural areas] to leapfrog up to the latest technologies," said Parker, "rather than simply catch up with existing urban systems."

Richard Silkman of the Maine State Planning Office astutely noted a a major roadblock to this goal: public utility commissions generally do not have the statutory authority to consider rural economic development when developing rate structures. That authority belongs with state legislatures.

Yet going to a state legislature to obtain that authority brings to public attention a fact usually obscured by the complexities of the ratemaking process: that ratemaking is a form of income distribution. Three PUC commissioners in Maine allocate $1.2 billion through their rate decisions, said Silkman. Give this power to the state legislature and the ratemaking process immediately becomes politicized.

A chicken-and-egg dilemma complicates the quest for upgraded rural telecommunications. Digital switching technology allows major reductions in costs, but only if a substantial capacity is actually used. As Heather Hudson pointed out, "A 747 plane <u>can</u> provide the lowest cost per mile but only <u>if</u> the seats are full." Yet as the national norms for telecommunications improve, leaving rural towns far behind, "we may need a new definition of 'universal service,'" said Hudson.

Small rural businesses face a special problem in agitating for better telecommunications, said Don Dillman of Washington State University. "In metropolitan areas, they can usually piggyback new services that big users have pioneered. But that doesn't occur in rural areas." Dillman suggested that rural businesses may have to forge some sort of alliance with agricultural concerns to lobby for better telecommunications.

But how can such a major infrastructure investment in telecommunications be justified when the potential benefits are speculative and may never materialize?

That is precisely why the public sector has to become involved, said Martin Strange. That is how electrification came to Nebraska in the 1930s.

"We shouldn't take the political climate as a given," Strange counseled, "because the political climate changes when people take an interest." He added that the current climate is not to eliminate subsidies but merely to privatize them.

Ken Deavers agreed that government has a critical role to play. "One of the past lessons of technology diffusion is that rural regions lag behind urban ones unless public policy deliberately intervenes. Without that intervention, rural will again lag behind -- at a time when rural is already under great pressure and undergoing rapid change."

Cynthia Duncan of the Aspen Institute lamented the fact that "people are so slow in recognizing that telecommunications are a public issue. We need to figure out strategies to popularize the issue and open it up to public discussion."

One way to do this, suggested Philip Burgess, is to explain, clearly and simply, what benefits the new technologies can provide. What is happening instead, "lawyers and engineers and policy people who take the political climate as given" are failing to explain and sell the new technologies, Burgess said. What is needed is better leadership to change the policy climate and better marketing savvy to promote the new systems.

What Role Should Government Play?

Breaking the current stalemate in both rural economic development and telecommunications improvements will require active government intervention, most participants agreed.

There are many worthy models to emulate or adapt: the space program, rural electrification, the transcontinental railroads, TVA and Bonneville Power, and other major infrastructure investments.

Kenneth Deavers suggested that the REA, which has largely accomplished its original mission, be rechartered with the mission of modernizing rural telecommunications.

How to do this? Without more interest by the next Administration or Congress, it may be impossible. Still, a logical advocate for revamping the REA would be the National Rural Electric Cooperative Association. While this group is

not focussed solely on agricultural concerns any more, it does not seem to have the innovative spirit or intellectual capacity to tackle such an ambitious campaign, participants agreed.

What about the "force-fed" technology demonstrations such as "Greenthumb" and "Grassroots"?

They had two major problems, said Hudson. First, the ideas did not originate from the user populations and so were not always useful. Second, the projects were conducted free, so when the funding ran out, they were not ready to stand on their own two feet -- and died. Dillman said these projects ought to be tried again now; today's better technologies could make them work.

Projects with social objectives ought to be publicly funded, said Bates. But economic development projects work better with some sort of quasi-public authority with a legislative charter. In Nebraska, the legislature chartered a telecommunications center with a research and development mission. With initial funding of $2 million from the state, the center hopes eventually to be self-supporting, at which point it will pay back the government by selling the government's equity stake in the center.

If economic development is going to work, said Bates, "institutional structures are going to have to adapt. The REA can't adapt fast enough."

In deciding whether to make rural telecommunications investments, the government should not rely solely on cost-benefit analysis, said Stuart Rosenfeld, because it would be entirely too speculative. "We didn't do that for the interstate highways. Besides, the social costs of declining communities aren't part of the cost-benefit equation."

Silkman pointed out that public utility commissions could play a role in telecommunications and economic development, but "we have abrogated responsibility for making them focus on that." For example, when the Maine PUC had a $3 million windfall to dispense -- more than the legislature ever spends for economic development -- it chose merely to lower residential rates by 50 cents a month.

Michael Rice pointed out the conventional rationale for such a response: market forces, not the heavy hand of government, should shape the course of future investment in telecommunications.

"But that's the worst of both worlds," said Ed Parker, "because this is a regulated environment." Still, replied Rice, billions of dollars in private investment have fueled fiber optics and other telecommunications advances -- and regulatory barriers are falling.

"My only point," said Silkman, "is that PUCs are making their decisions with no input from legislatures arguing for rural economic development."

The most important task for government, said Philip Burgess, is to develop institutional mechanisms that aggregate markets. The agricultural extension services created an educated user and delivery system to diffuse technologies. What we want to diffuse are not programs or technologies but ways of aggregating markets.

"So model programs should be institutional experiments that have less to do with technology or rural circumstances than with leadership and empowering people to make demands on the existing system," Burgess said.

Telecottages in America?

One way that Scandinavian governments have spurred the use of telecommunications in rural areas is through telecottages -- community centers which provide such services as facsimile and telex transmissions, electronic mail, data processing, language translations, and other services.

The first Swedish telecottage was established in 1985 in Vemdalen, Richard Adler reported. Some 30% of the town's population and all generations now participate in classes and events sponsored by the telecottage. By charging for services to local businesses, the telecottages have reached the break-even point and no longer subsist on government funding. (Some telecottages are run as social services, with no expectation that they will be financially self-supporting.)

The movement has succeeded so well that in September 1988, the 20 Swedish telecottages will open a Stockholm marketing office to solicit business, which will be electronically transmitted to and from the rural towns. Within a few years, another five to ten telecottages are expected to open.

One of the most innovative aspects of the telecottages is their language translation services. Using a network of translators in rural areas, the telecottages collectively offer translation services for a wide range of languages.

Two cultural factors are important to the success of the telecottages, said John Bryden. First, there is the Scandinavian "folk high school" tradition which bolsters the sense of community solidarity. Second, there is a national ethos of decentralization which encourages people to treat the telecottages as town halls or community meeting centers.

Can the telecottage model work in the United States, which puts a greater premium on private-sector solutions? Many telecottage services are already provided by private companies, noted Cynthia Duncan. For example, many photocopy centers have expanded into telecommunications and information services. Ted Bradshaw suggested that the franchise model could provide a vehicle for disseminating these services in the U.S.

Several participants urged that telecottage experiments be tried in the U.S. using public institutions such as libraries, schools, universities, agricultural extension services. Also, county fairs are a traditional forum for exposing people to new things; they could be used to promote telecommunications.

"Telecottages struck me as a practical, modest initiative that, with modifications, could work in the U.S.," said Adler. Different models should be tried and a special emphasis should be put on public outreach.

Future Directions

Given the problems and potential that telecommunications holds for rural economic development, what future directions should be pursued?

The answers fell into two general (and overlapping) categories -- research and action. Participants suggested that future research seek to answer the following questions:

1. What criteria and information are needed to develop a long-range strategy for investing in telecommunications in rural areas? [Rosenfeld]

2. Does telecommunications encourage economic growth in rural areas, or does it hasten decline? How does this happen? What are the linkages? [Dillman, Collins, Roche] Case studies would be particularly useful. [Hudson] Studies on the impact on small business would also be helpful. [Williams]

3. What are the factors that attract people to settle in rural areas? [Dillman]

4. How can rural policy allow some degree of community choice while achieving a reasonable pace of implementation? What role should community organizations, and governments at federal, state and local levels, play? [Mountcastle]

5. How can or should policymakers exploit telecommunications to help rural American adapt to change? [Bates]

6. Can a compelling conceptual rationale be developed to promote rural telecommunications as an urgent public issue deserving government attention? [Duncan]

7. How extensive are the technical barriers to installing enhanced telecommunications in rural areas? How many communities do not have digital switches, and what difference might they make? There is a need to build a comprehensive, reliable data base. [Bradshaw]

8. What lessons can U.S. policymakers learn from foreign nations about how new electronic technologies can create jobs, improve native industries, and expand democratic participation? [Bryden]

Participants also suggested several action strategies (which would require further research to implement). These included:

1. Grassroots Institution-building

a. Help build ongoing institutions (user groups, research centers, community centers) that can generate new knowledge about rural telecommunications, advocate their use, and build competence among potential users. [Bollier]

b. Nurture innovative, decentralized institutions to aggregate markets in rural areas and develop leadership -- emulating the model of the agricultural extension service. [Burgess, Silkman]

c. Forge new types of public/private-sector cooperation to research and implement rural telecommunications initiatives. [Cohen]

2. Telecommunications Education.

a. Develop telecommunications education programs for rural entrepreneurs, guided by their indigenous needs. Seminar participants should be charged some fee, even if discounted, so that the program will remain sensitive to market demands. [Roscoe, Silkman]

b. Develop a rural entrepreneurs' telecommunications support system to provide technical assistance and help meet basic business needs. [Briggs, Jacobson]

c. Educate rural people about the telecommunications choices they face, so that they can make the best choice for their communities. [Rice]

3. Mobilize Government.

a. Institutionalize a long-term governmental commitment to rural economic development. By adapting the extension service model, the government should foster the use of telecommunications to improve the delivery of human services in rural communities; facilite rural business formation and success; and empower disadvantaged rural people. [Deavers]

b. Explore political strategies to make this happen (pressure the REA? NRECA? Presidential campaigns?). [Sechler]

c. Revitalize the Rural Electrification Administration to undertake the revamping of rural telecommunications. [Parker]

d. Educate policymakers, especially at the federal level and at state public utility commissions, about rural telecommunications and economic development. [Holmes]

e. Develop inspirational anecdotes about telecommunications and rural development successes so that the public, businesses, and government leaders can more easily understand the complex, abstract issues surrounding telecommunications. [Rice]

4. Telecottages.

Sponsor a demonstration project of telecottages (after studying in a systematic way the feasibility of creating telecottages in the U.S.). The project should include an evaluation component to assess actual strengths and weaknesses. [Adler, Hudson]

5. Empowerment.

Develop applications of telecommunications that will alter existing power relationships, empower the farmer/ entrepreneur, and make markets more competitive. [Strange]

If any future conferences such as this one are held, participants recommended inviting officials from the National Rural Economic Cooperative Association, the Rural Electrification Administration, independent telephone companies, congressional subcommittees, long-range planners from regional Bell operating companies (RBOCs), and members of state public utility regulatory commissions.

The Importance of Communications and Information Systems to Rural Development in the United States

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